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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/554,101	10/21/2005	Tsutomu Shibata	Q90231	6582

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EXAMINER	
DIAZ, JOSE	
ART UNIT	PAPER NUMBER
2879	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/554,101	SHIBATA, TSUTOMU	
	Examiner	Art Unit	
	JOSE M. DIAZ	2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 October 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 October 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *10/21/2005, 4/26/2006, 10/30/2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> a. A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yoshida (JP 51027639)**, in view of **Brinkmann (5075176)**.

Regarding **claim 1**, Yoshida clearly shows and discloses a spark plug comprising: an insulator (insulating glass tube) having a through-hole (shaft hole) formed in an axial direction; a terminal attachment (terminal shaft) disposed on one end side of said insulator; a center electrode (electrode shaft) disposed on other end side of said insulator; and an electrically conductive connection layer (conductive sealing material) disposed in said through-hole for electrically connecting said terminal attachment and said center electrode to each other, said electrically conductive connection layer including at least one electrically conductive sealing layer connected to at least one of said terminal attachment and said center electrode, wherein said electrically conductive sealing layer is made of electrically conductive glass containing a glass component, and a metal component which at least contains a Cu-Zn (¶s [0002], [0006] , Table 1, row 11, Table 2 ¶ [0020]).

However, Yoshida fails to exemplify that the Cu-Zn contained in the metal component is in an alloy form.

Brinkmann discloses that an alloy formation provides a better electric resistance and mechanical strength that pure metals (col. 2, lines 26-29), therefore it is considered within the capabilities of one skilled in the art to provide the Cu-Zn contained in the metal component in an alloy form, in order to improve the mechanical strength of the conductive sealing material.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the Cu-Zn contained in the metal component is in an alloy form as taught by Brinkmeann in the device of Yoshida, in order to improve the mechanical strength of the conductive sealing material.

Regarding **claim 2**, Yoshida clearly shows and discloses the claimed invention.

However, Yoshida fails to disclose that substantially all Zn contained in said metal component is alloyed.

Brinkmann discloses that an alloy formation provides a better electric resistance and mechanical strength that pure metals (col. 2, lines 26-29), therefore it is considered within the capabilities of one skilled in the art to provide for the Zn contained in said metal component to substantially all alloyed.

Same rationale to combine from the rejection of claim 1 applies.

Regarding **claim 3**, Yoshida clearly shows and discloses a method for producing a spark plug including an insulator (insulating glass tube) having a through-hole (shaft hole) formed in an axial direction, a terminal attachment (terminal shaft) disposed on one end side of said insulator, a center electrode (electrode shaft) disposed on other

end side of said insulator, and an electrically conductive connection layer (conductive sealing material) disposed in said through-hole for electrically connecting said terminal attachment and said center electrode to each other, said electrically conductive connection layer including at least one electrically conductive sealing layer connected to at least one of said terminal attachment and said center electrode, said method comprising the steps of: filling said through-hole (shaft hole) of said insulator (insulating glass tube) with electrically conductive glass powder (conductive sealing material) containing glass powder (borosilicate barium glass) and metal powder containing at least Cu-Zn powder; and softening said electrically conductive glass powder to form said electrically conductive sealing layer (¶s [0002], [0006]-[0007] , Table 1, row 11, Table 2 ¶ [0020]).

However, Yoshida fails to exemplify that the Cu-Zn contained in the metal powder is in an alloy form.

Brinkmann discloses that an alloy formation provides a better electric resistance and mechanical strength that pure metals (col. 2, lines 26-29), therefore it is considered within the capabilities of one skilled in the art to provide the Cu-Zn contained in the metal powder in an alloy form, in order to improve the mechanical strength of the conductive sealing material.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the Cu-Zn contained in the metal powder is in an alloy form as taught by Brinkmeann in the device of Yoshida, in order to improve the mechanical strength of the conductive sealing material.

Regarding **claim 4**, Yoshida clearly shows and discloses that the electrically conductive glass powder contains said metal powder larger than 30 mass% and smaller than 75 mass% (Table 1, row 11 shows a 50 mass%).

Regarding **claim 5**, Yoshida clearly shows and discloses that the metal powder contains said Cu-Zn powder larger than 10 mass% (Table 1, row 11 shows a 50 mass%).

However, Yoshida fails to exemplify that the Cu-Zn contained in the metal powder is in an alloy form.

Brinkmann discloses that an alloy formation provides a better electric resistance and mechanical strength that pure metals (col. 2, lines 26-29), therefore it is considered within the capabilities of one skilled in the art to provide the Cu-Zn contained in the metal powder in an alloy form, in order to improve the mechanical strength of the conductive sealing material.

Same rationale to combine from the rejection of claim 3 applies.

Regarding **claim 6**, Yoshida clearly shows and discloses that the metal powder contains said Cu-Zn powder larger than 50 mass% (¶ [0020], Table 2, row 16 shows a 55 mass%).

However, Yoshida fails to exemplify that the Cu-Zn contained in the metal powder is in an alloy form.

Brinkmann discloses that an alloy formation provides a better electric resistance and mechanical strength that pure metals (col. 2, lines 26-29), therefore it is considered

within the capabilities of one skilled in the art to provide the Cu-Zn contained in the metal powder in an alloy form, in order to improve the mechanical strength of the conductive sealing material.

Same rationale to combine from the rejection of claim 3 applies.

Regarding **claim 7**, Yoshida clearly shows and discloses that the metal powder does not contain any non-alloyed Zn powder (Table 1, row 11).

Regarding **claim 8**, Yoshida clearly shows and discloses that the Cu-Zn powder contains 5 to 40 mass% of Zn (Table 1, row 11).

However, Yoshida fails to exemplify that the Cu-Zn contained in the metal powder is in an alloy form.

Brinkmann discloses that an alloy formation provides a better electric resistance and mechanical strength that pure metals (col. 2, lines 26-29), therefore it is considered within the capabilities of one skilled in the art to provide the Cu-Zn contained in the metal powder in an alloy form, in order to improve the mechanical strength of the conductive sealing material.

Same rationale to combine from the rejection of claim 3 applies.

Regarding **claim 9**, Yoshida clearly shows and discloses that the electrically conductive glass powder contains inorganic oxide of semiconductor as at least one member selected from In, Sn, Cr, V and Ti (¶ [0020], Table 2, row, 16 and 17).

Regarding **claim 10**, Yoshida clearly shows and discloses that the electrically conductive glass powder contains said semiconductor inorganic oxide smaller than 10

parts by mass when a total amount of said glass powder and said metal powder is 100 parts by mass (¶ [0020], Table 2, row, 16 and 17).

Regarding **claim** 11, Yoshida discloses the claimed invention.

However, Yoshida fails to exemplify that a mean particle size of said metal powder is not smaller than 5 μm and not larger than 40 μm.

It is considered within the capabilities of one skilled in the art to provide a mean particle size of said metal powder is not smaller than 5 μm and not larger than 40 μm as an obvious matter of design engineering.

Accordingly, it would have been obvious to one having ordinary skill in the art at the time the invention was made to determine a workable particle size, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable range involves only routine skill in the art. In re Aller, 105 USPQ 233.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOSE M. DIAZ whose telephone number is (571)272-9822. The examiner can normally be reached on 7:00 - 5:00 EST Monday-Thursday; Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on 571-272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/José M. Díaz/
Examiner, Art Unit 2879

/Mariceli Santiago/
Primary Examiner, Art Unit 2879